PROJECT TITLE

Black Carbon Validation of a Novel Sensor for Traffic-Related Indoor Air Pollution

KEY PERSONNEL

Principal Investigator: Jennie Cox (mentee)	University of Cincinnati
Co-Investigator: Sergey Grinshpun (mentor)	University of Cincinnati
Consultant: Seung-Hyun Cho	Research Triangle Inst.

ABSTRACT

Exposure to traffic-related air particulates (TRAP) is linked with reduced respiratory health in both public and worker populations. It has been determined that TRAP penetrates homes and occupational settings, affecting the indoor air quality. Better methods are needed for fast and accurate assessment of efficiency of control methods. A novel MicroPEM™ (Personal Exposure Monitor) device was recently developed at Research Triangle Institute (RTI) International as a personal exposure monitoring device capable of direct reading measurement of PM2.5 with a simultaneous collection to a Teflon filter. Preliminary data, based on the Pilot Research Project 2015 grant, is focused on developing a correction factor for analysis of traffic-related airborne particles (TRAP) in the Cincinnati region. This study will build upon what we have learned. We proposed to use the unique opportunity to test another novel device, AethLabs microAeth Black Carbon (BC) sensor in an ongoing study that is funded by U.S. Department of Housing and Urban Development Healthy Homes Technical Studies (HHTS). We hypothesize that the microAeth data and the average and the MicroPEMs BC filter data will be statistically similar. In the first specific aim, we will determine the association between the microAeth BC sensor and the BC collected on each MicroPEM filter both indoors and outdoors in buildings close to highways. A multiwavelength optical absorption technique will be used to apportionment of environmental tobacco smoke and soot (black) carbon. The determination of tobacco smoke and carbon with reasonable accuracy is possible using an integrating sphere radiometer and multiple wavelengths to provide specificity. The second specific aim is to determine a correlation coefficient between the MicroPEM PM2.5 direct-reading data and the microAeth BC sensor direct reading data for the assessment of traffic-related indoor pollution. The tested sensors, once validated, will be easy and useful tools to determine occupational exposure to traffic-related indoor air pollution.

University of Cincinnati
17th Annual
Pilot Research Project
Symposium
October 13-14, 2016

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Produced by Kurt Roberts Department of Environmental Health

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Pilot Research Training Program (PRP) Overview

Welcome to the University of Cincinnati Education and Research Center's (ERC) 16th Annual Pilot Research Project (PRP) Symposium on October 8-9, 201Welcome to the University of Cincinnati Education and Research Center's (ERC) 17th Annual Pilot Research Project (PRP) Symposium on October 13-14, 2016, held in the Auditorium of Proctor Hall, College of Nursing. The purpose of the PRP is to increase the research capacity of research trainees and young investigators in occupational health and safety and to encourage those in related disciplines to pursue occupational health and safety research.

Under the administrative direction of Dr. Amit Bhattacharya, research proposals are solicited and peer-reviewed annually from qualifying faculty and graduate students from the **University of Cincinnati and the following PRP partnering institutions – Air Force Institute of Technology, Bowling Green State University, University of Toledo – Health Science Campus, Central State University, Purdue University, University of Kentucky, Western Kentucky University, Eastern Kentucky University, Murray State University, Ohio University and Kentucky State University**.

At this symposium, the 2015-16 awardees will be presenting the results of their research and the 2016-17 awardees will make poster presentations of their proposed work. The keynote speaker on Thursday, October 13, 2016 is **Anita Schill, PhD, MPH, MA**, Senior Science Advisor to the Director and Co-Manager for the Total Worker Health® Program with the National Institute for Occupational Safety and Health (NIOSH), will deliver the keynote address on "**Advancing Well-Being Through Total Worker Health.**"

The University of Cincinnati's Education and Research Center is one of 18 such centers funded by the National Institute for Occupational Safety and Health (NIOSH) nationally. Dr. Tiina Reponen serves as the director of the ERC, which is based in the university's Department of Environmental Health within the College of Medicine. The purpose of the ERC is to train professionals in the didactic and research skills necessary to lead the occupational safety and health disciplines. Results of research are translated into action through an outreach program and shared with professionals and practitioners in the region via continuing education.

Since 1999, the PRP program has allocated over $1.3 million to support 222 pilot research projects. These projects have served as a catalyst in bringing over $34 million in additional research support to the region from sources independent of the PRP program, such as, the National Institute for Occupational Safety and Health (NIOSH), National Institutes of Health (NIH), United States

Department of Agriculture (USDA), National Science Foundation (NSF), and the Centers for Disease Control and Prevention (CDC). Additionally, the PRP has brought 47 new investigators from other fields of expertise to the area of occupational safety and health research.

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